Supplementary text on figures and refences

Note: This is the supplementary material to be inserted in the main article .Figures are to be placed in the space provided and references are to be placed at the end of the article under heading "References and further reading".

1. **Figure 1 :**

Fig.1 shows the topological mapping of points on a Eulidean plane.This map is showing exteral only and emphasis is on the display of properties of distance function and Trigle inequality.

2. **Figure 2** :

Fig.2 shows the points on a standard convex polygon and shortest route through them.[Theorem 1 and 2]

3. **Figure3** :

Fig.3 shows the application of ‘a+b-c’ rule.[Point segment theorem]

4. **Figure 4** :

Fig. 4. Shows the shortest route through SCP got after step two i.e.after applying ‘a+b-c’ rule on SCP

5.Figure 5:

Fig.5 Shows the next network case i.e when two or more independent networks are joined through the shortest segment.

6.Figure 6:

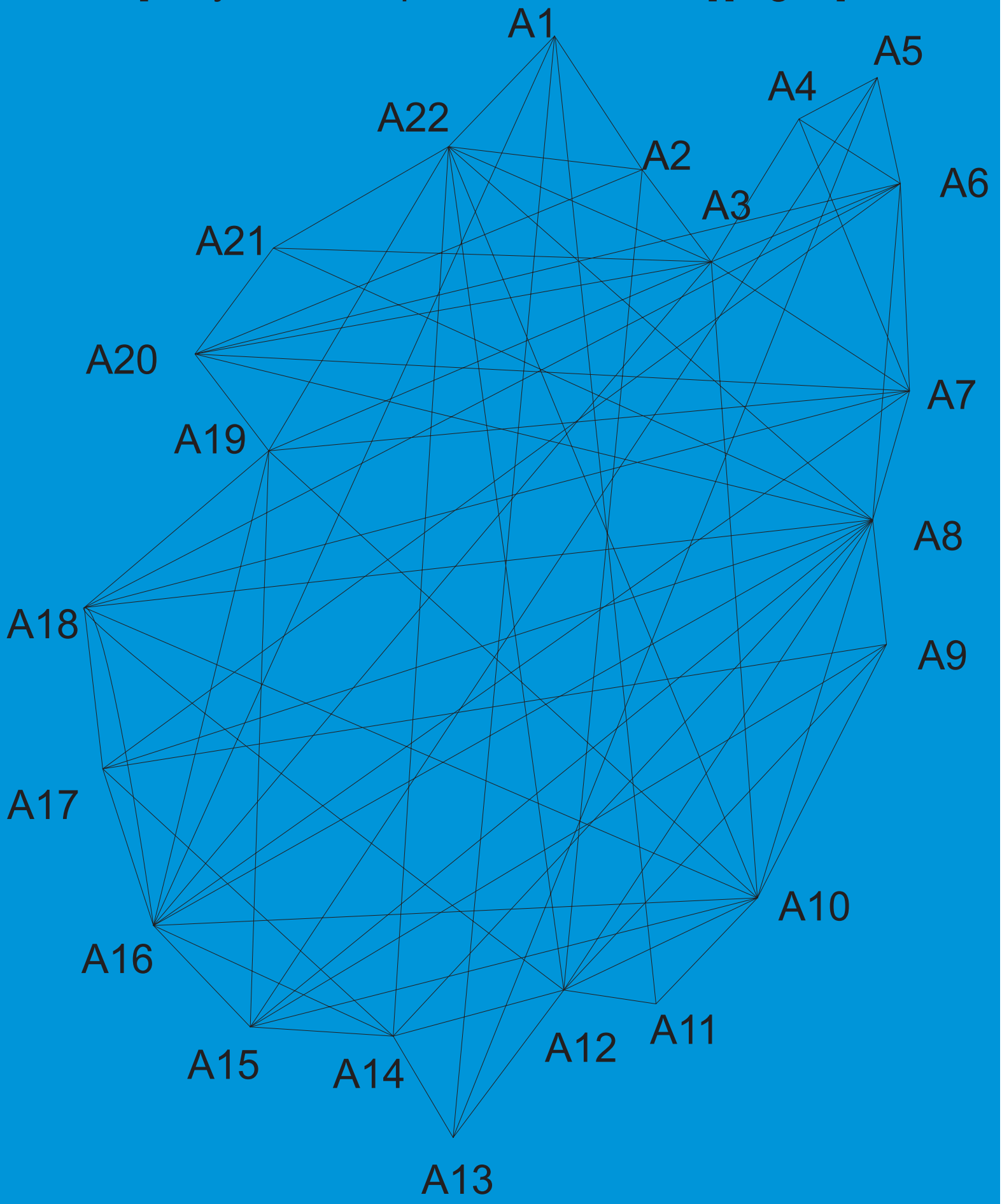
Fig.5 shows the' a+b-c-d' rule [Segment to Segment rule].

7.Figure7:

Fig. 6 shows the shortest route through the 'n' points

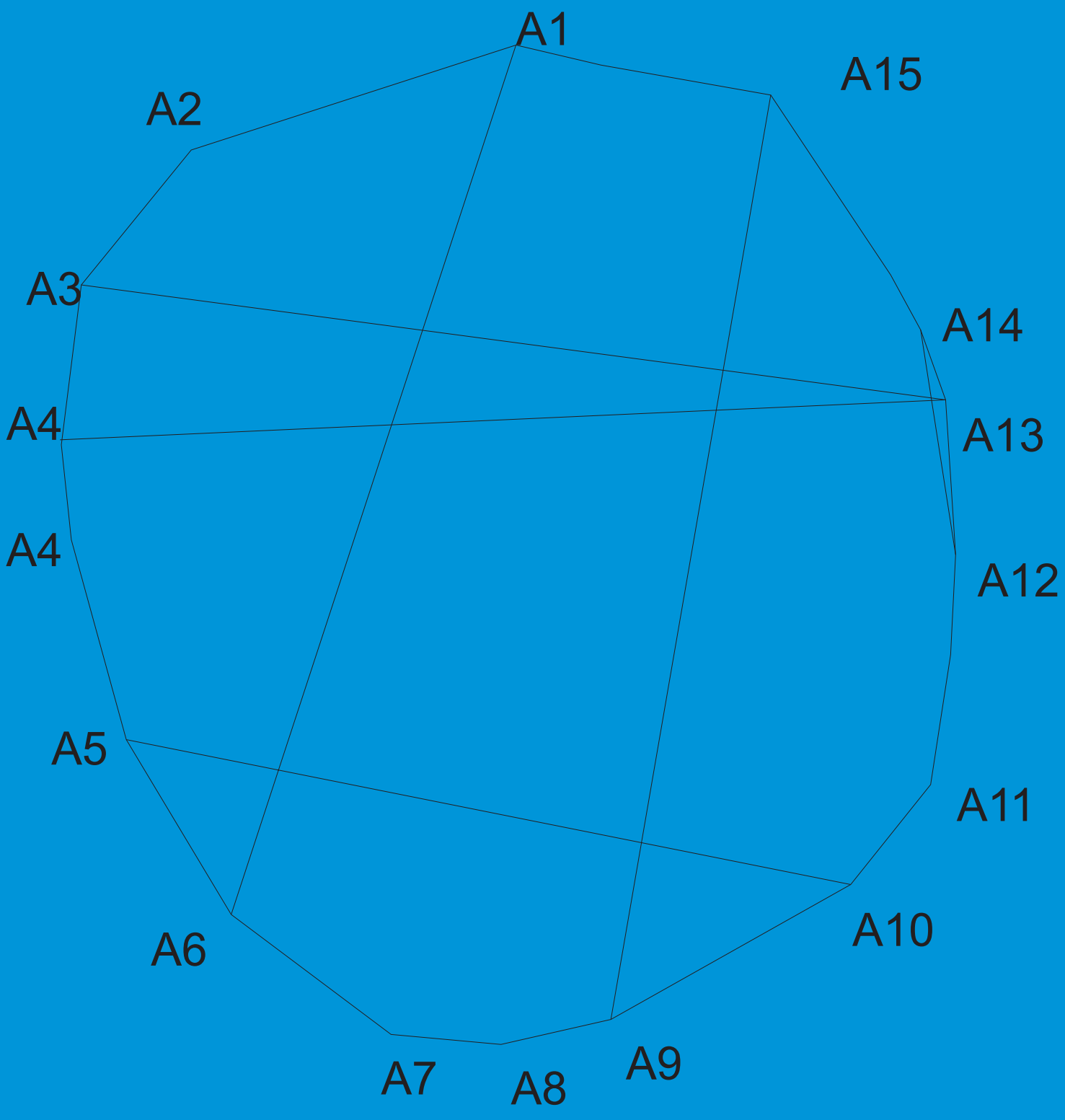
8. Figure8(a) & 8(b):Figure 8(a) represents A comparison between an universal optimal tour (hypothetical) between n points and local optimal tour

Distance Function and Topological Maps
[Only external points are shown][Fig. 1]

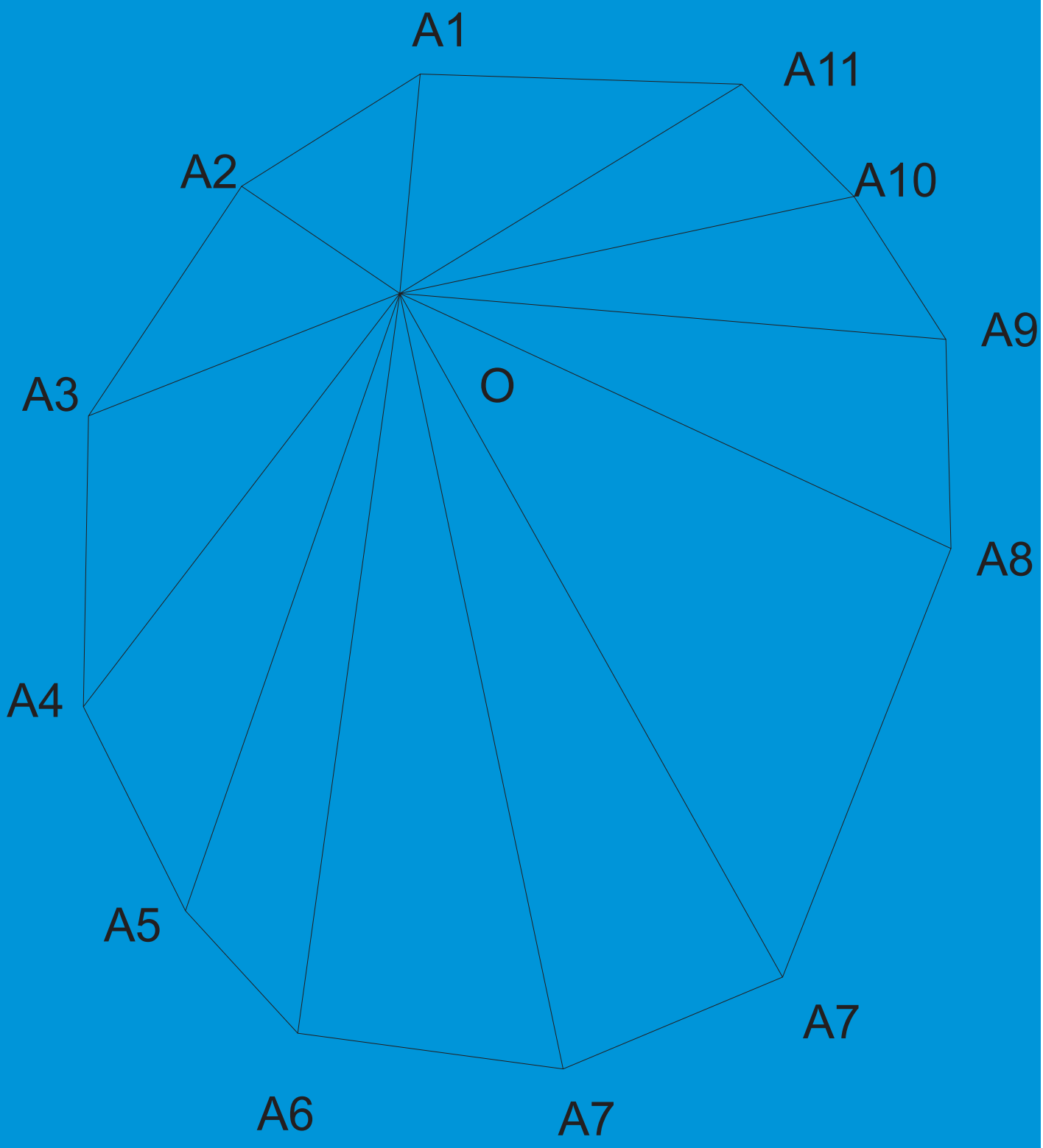


Shortest route through the periphery of a standard convex polygon

[Theorem] [Fig. 2]



Point segment theorem i.e. ‘ a+b-c’ rule [Fig.3]

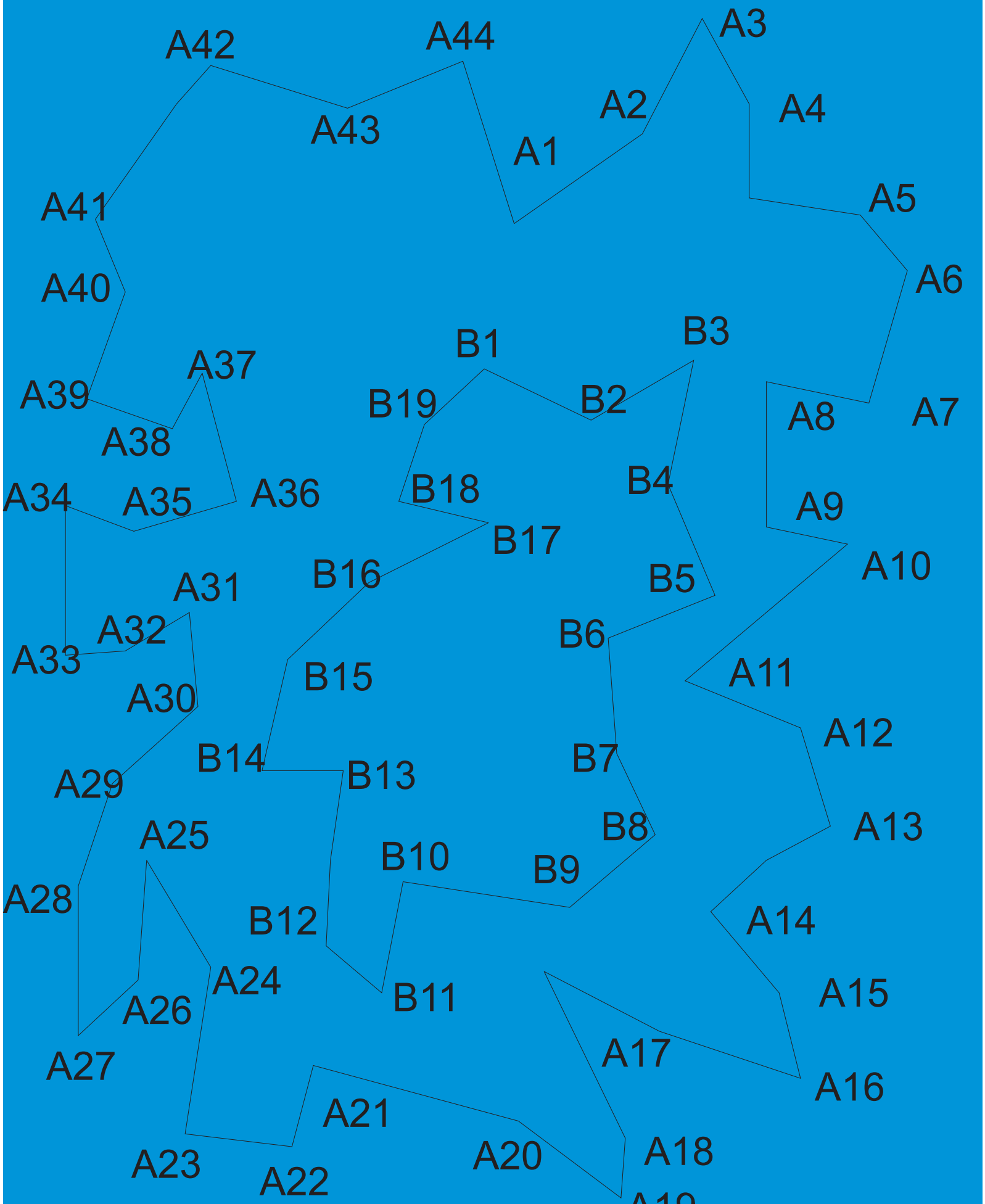


Shortest route got after step two i.e.after applying ‘a+b-c’ rule on SCP [Fig.4]

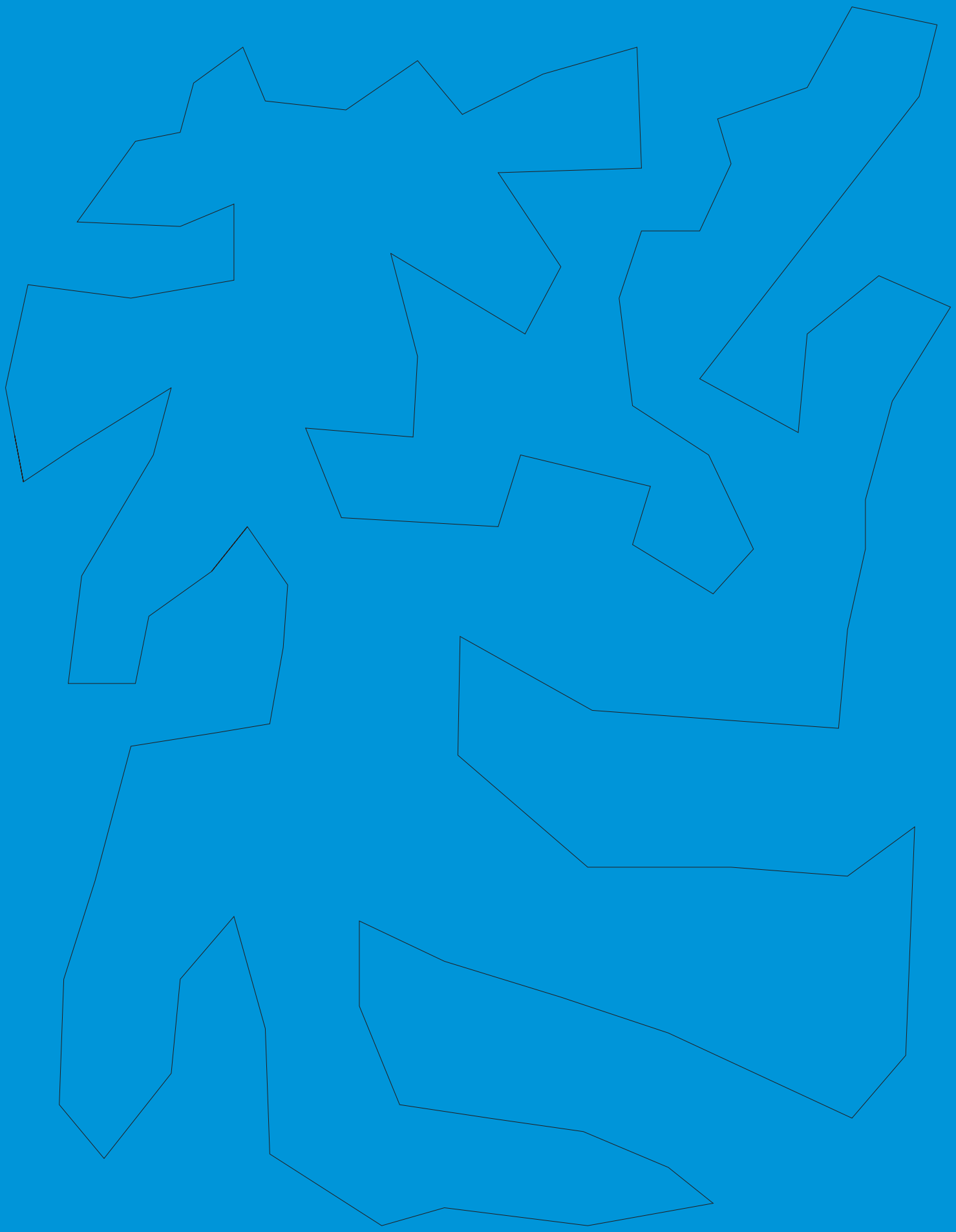
The next network case [Fig.5]

Segment to segment rule i.e. "a+b=c+d"

rule ’ [Fig. 6]



The shortest route [Fig. 7]



Comparison between local and optimal tour [Fig.8(a) and Fig.8(b)]

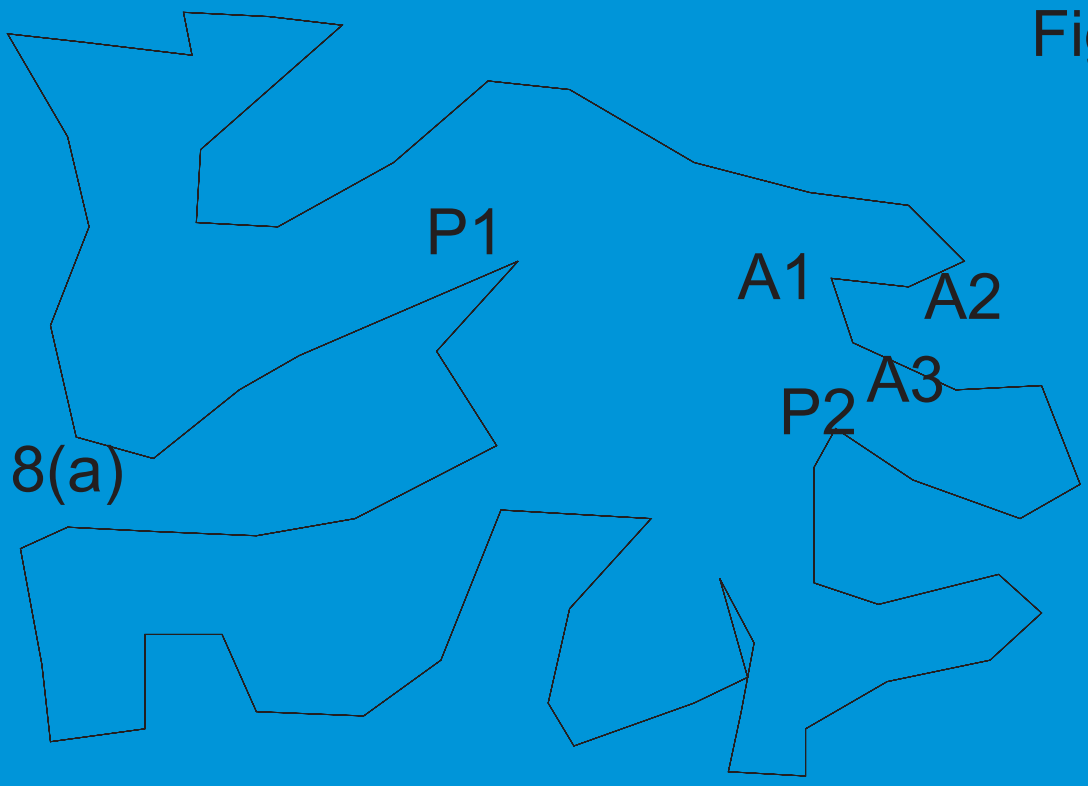


Fig. 8(a)

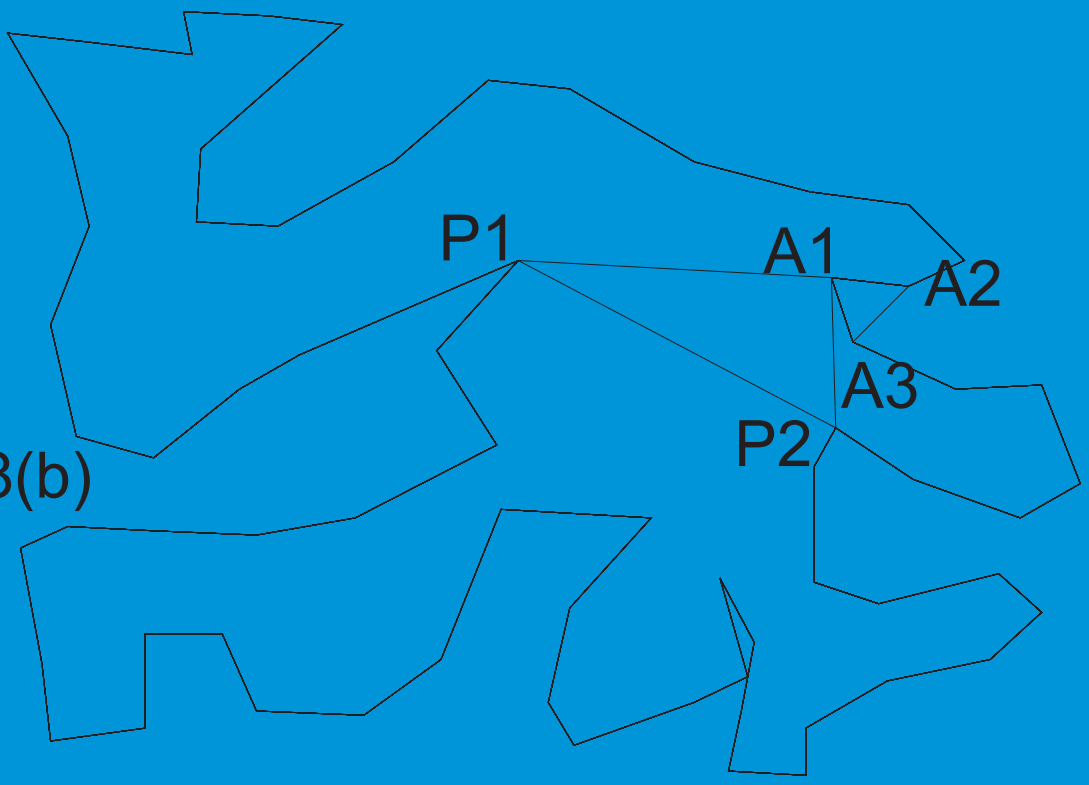


Fig. 8(b)

References , links and Further reading

1. http://www.tsp.gatech.edu/optimal/index.html
2. http://www.tsp.gatech.edu/sweden/tours/zoom1/swmap.htm
3. Http//mathworld.wolform.com/NP-Problem.html/
4. Http://en.wikipedia.org/wiki/Traveling_ Salesman_Problem.
5. Many other texts and links are available

   On these websites.The links 1 and 2 are

   About famous Sweden tour.The links 3 and 4 are useful for section 2,3 and 4.
6. "The Traveling Salesman Problem and its Variations,"Gutinand Punnen (eds), Kluwer Academic Publishers, 2002, 369-443.

   Http://www.research.att.com/~dsj/chtsp